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Title: Concentration growth of luminescence intensity of phosphor $\text{Zn}_{2-2x}\text{Mn}_{2x}\text{SiO}_4$ ($x \leq 0.13$): Crystal-chemical and quantum-mechanical justification

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Concentration growth of luminescence intensity of phosphor $\text{Zn}_{2-2x}\text{Mn}_{2x}\text{SiO}_4$ ($x \leq 0.13$): crystal-chemical and quantum-mechanical justification

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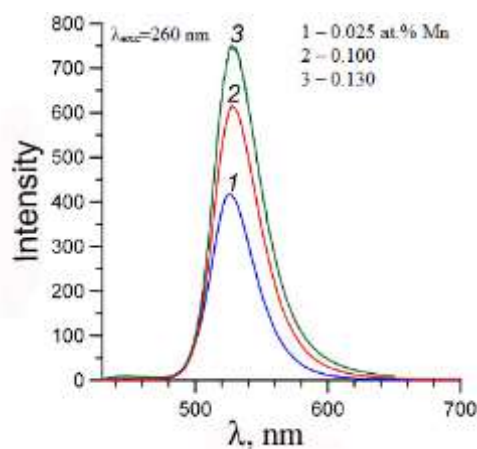
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Graphical abstract



Highlights

Willemite-based $\text{Zn}_{2-2x}\text{Mn}_{2x}\text{SiO}_4$ solid solution was produced by solid-state reaction.

Mn atoms are present as individual Mn^{2+} ions hosted within tetrahedral crystal field.

Stochastic distribution of Mn atoms is registered.

Luminescence intensity is maximal for $\text{Zn}_{1.74}\text{Mn}_{0.26}\text{SiO}_4$ upon increase of Mn content.

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